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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/777,661 | 02/07/2001 | Makoto Tsuruta | Q62661 | 9239 |

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

| EXAMINER | |
|---|---|
| FISCHER, JUSTIN R | |
| ART UNIT | PAPER NUMBER |
| 1733 | 4 |

DATE MAILED: 05/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/777,661 | TSURUTA, MAKOTO | |
| | Examiner | Art Unit | |
| | Justin R Fischer | 1733 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 February 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5* is/are rejected.

7)☒ Claim(s) *4 and 6-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata (US 4,702,115) in view of Gerresheim (US 5,879,483). As best depicted in Figure 1, Iwata discloses a pneumatic tire construction having a carcass extending between a pair of bead portions and a belt structure arranged on an outside of said carcass in the radial direction, such that said belt structure is formed of a radially inner belt reinforcement (1) and a radially outer belt (2), as defined by the claimed invention. In this instance, the belt reinforcement is composed of one belt reinforcing layer having circumferential reinforcing elements and the "belt" is composed of a pair of crossed belt layers containing reinforcing elements that are inclined with respect to the equatorial plane of the tire (Column 3, Lines 52-66). Furthermore, Iwata incorporates a restraining rubber (cushion rubber C) having a width greater than 4 millimeters and arranged outward from a widthwise outer end of a widest-width belt layer (Column 4, Lines 17-22 and Figure 1). Iwata also suggests that the cushion rubber have rubber properties similar to those of a coating rubber for the carcass and the belt (Column 6, Lines 60-64); however, the reference does not provide any further teaching or suggestion to relate the hardness of the cushion rubber to the hardness of the belt reinforcement coating rubber.

Gerresheim is similarly directed to the use of cushion rubbers between the belt and the carcass and suggests a range of hardness values between 65 and 75 Shore A (Column 2, Lines 1-13), it being known that belt coating rubbers conventionally have a hardness between 50 and 60 Shore A. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the cushion rubber from a harder rubber, as compared to the belt reinforcement coating rubber, in view of Gerresheim, as set forth below.

Regarding claims 1 and 2, Iwata depicts and describes all the limitations of the claimed invention with the exception of specifically comparing the cushion rubber hardness to the hardness of the belt reinforcement coating rubber. The reference, though, does suggest that the relevant rubbers can have similar rubber properties. One of ordinary skill in the art at the time of the invention would have recognized that this language is directed to a plurality of embodiments, including a design in which the hardness of the cushion rubber and the belt reinforcement coating rubber are the same. It should be noted that the claims as currently drafted do not exclude a design in which the cushion rubber and the belt reinforcement coating rubber have the same hardness. Furthermore, it is known that such cushion rubbers need to be highly resistant to compression to eliminate or reduce belt edge separation and as such, the language "similar rubber properties" would have motivated one of ordinary skill in the art at the time of the invention to form the relevant rubbers in accordance to the limitations of the claimed invention, as detailed above.

With respect to claim 2, the applicant requires that the hardness of the cushion rubber is between 65 and 85 JIS. Although Iwata does not suggest a hardness for said cushion rubber, the hardness range defined by the claimed invention is broad and represents conventional values used in the tire industry. For example, Gerresheim discloses the use of cushion layers between the carcass and the belt and between adjacent belt layers and suggests that all cushion layers have a hardness between 65 and 75 Shore A, which is almost identical to the JIS hardness measurement (Column 2, Lines 1-13). As such, it is evident that the claimed invention defines a broad and conventional range for the hardness of shoulder cushion rubbers and one of ordinary skill in the art at the time of the invention would have readily appreciated and expected the hardness of the cushion rubber in Iwata to have a value between 65 and 85 Shore A.

3. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cluzel (US 5,996,662) in view of Gerresheim. As best depicted in Figure 2, Cluzel discloses a pneumatic tire construction comprising a carcass extending between a pair of bead portions and a belt structure arranged on an outside of said carcass in the radial direction, such that said belt structure is formed of a radially inner belt reinforcement (20) and a radially outer belt (21, 22), as defined by the claimed invention. In this instance, the belt reinforcement is composed of one belt reinforcing layer having circumferential reinforcing elements and the "belt" is composed of a pair of crossed belt layers containing reinforcing elements that are inclined with respect to the equatorial plane of the tire (Column 2, Lines 5-15). Furthermore, Cluzel incorporates a restraining

rubber (cushion rubber 5) having a width greater than 4 millimeters and describes it as having a high modulus of extension or a secant modulus at 10% relative elongation of between 10 and 20 MPa (Column 2, Lines 25-32 and Lines 40-45). However, the reference does not compare the hardness of the cushion rubber to the hardness of the belt reinforcement coating rubber. Gerresheim, on the other hand, suggests that cushion rubbers conventionally have a hardness between 65 and 75 Shore A, it being known that belt coating rubbers conventionally have a hardness between 50 and 60 Shore A. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the cushion rubber of Cluzel with a hardness equal to or greater than the belt coating rubber, in view of Gerresheim, as set forth below.

As per claims 1-3 and 5, in describing cushion rubber 5, Cluzel states that it has a high modulus of extension or a secant modulus at 10% elongation between 10 and 20 MPa. Although Cluzel is silent as to the hardness of the cushion rubber, the hardness and modulus are known to be positively associated (i.e., high modulus, high hardness). Thus, by defining the cushion rubber as having a "high modulus", the reference is necessarily directed to a cushion rubber with a "high hardness". However, there is no comparison of this "high hardness" cushion rubber with the belt reinforcement coating rubber. Gerresheim, though, discloses the use of cushion rubbers to prevent belt edge separation and suggests that they have a hardness between 65 and 75 Shore A, preferably 74 (Column 2, Lines 1-13). Furthermore, belt coating rubbers conventionally have a hardness between 50 and 60 Shore A. Therefore, in view of Cluzel's description of a "high hardness" cushion rubber and Gerresheim's suggestion that cushion rubbers

(between carcass and belt and between belt layers) generally have a hardness between 65 and 75 Shore A, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the cushion rubber with a higher hardness as compared to the belt coating rubber. Lastly, it is well known in the tire industry that cushion rubbers need to be highly resistant to compression in order to effectively reduce belt edge separation, it being further known that a high hardness rubber compound results in the desired compression resistance.

With respect to claim 2, applicant requires a cushion rubber hardness between 65 and 85 JIS. As stated above, Cluzel defines a "high hardness" cushion rubber but fails to expressly suggest any values for the hardness. In any event, the range defined by the claimed invention is broad and represents conventional hardness values. For example, Gerresheim discloses the use of cushion rubbers having a hardness between 65 and 75 Shore, which is almost identical to JIS, to prevent belt edge separation. Therefore, in view of Cluzel's description of a "high hardness" rubber, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the cushion rubber of Cluzel within the conventional range outlined by the claimed invention, especially in view of Gerresheim.

Regarding claim 3, Figure 2 of Cluzel depicts the gauge of the cushion rubber as being greater than the thickness of the belt reinforcement at the widthwise outer end of the belt reinforcement.

With respect to claim 5, the cushion rubber of Cluzel extends inward in the widthwise direction so as to cover the widthwise outer end part of the belt reinforcement.

***Allowable Subject Matter***

4. Claims 4 and 6-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. There was no reference in the prior art search that suggested the manufacture of pneumatic tires having, in addition to the general tire structure (bead, carcass, tread), a radially inner belt reinforcement containing at least one ply formed of circumferential reinforcing elements, a radially outer belt formed of at least two crossed plies, such that the widest ~~with~~ width belt reinforcement ply is arranged outward from a widthwise outer end of a widest width belt layer, and a cushion rubber having a width of greater than 4 millimeters and a hardness greater than the hardness of the belt reinforcement coating layer, wherein the cushion rubber is formed as an extension of the belt reinforcement ply (i.e. integrally united with coating rubber). Also, there was no reference in the prior art search that suggested the structure detailed above in which the cushion rubber is not "integrally united" and either (a) passes over the outer end of the belt reinforcement in the radial direction up to a zone between the belt reinforcement and a widthwise outer end of the widest width belt layer, (b) envelops the widthwise outer end of the belt reinforcement from its outside and inside in the radial direction, (c) is formed of two or more radially laminated rubber layers having a hardness in accordance to the limitations of the claimed invention, or (d)

has a JIS hardness that exceeds 85 degrees and results in the use of an additional rubber layer between the carcass and said cushion rubber.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bridgestone (JP 3-104706) and Yokohama (JP 63-235103) disclose a pneumatic tire construction having a pair of radially outer crossed belt plies and a radially inner belt reinforcement formed of circumferential reinforcing elements. Welter (US 4,262,726) teaches the use of a belt reinforcement layer formed of circumferential reinforcing elements in which said belt reinforcement layer has an axial width that is greater than the axial width of the widest-width crossed belt layer. The reference further suggests the use of a cushion rubber 29 between the belt reinforcement structure and the crossed belt layers. Imai (US 4,887,655) discloses a pneumatic tire design in which a cushion rubber is disposed between a carcass and a belt reinforcement structure formed of circumferential reinforcing elements. The reference also describes the use of additional layers in the belt that are crossed relative to one another. Hanus (US 3,598,165) suggests the use of shoulder cushion rubbers or layers of cushion rubber having a hardness and modulus that is greater than the adjacent rubber compounds (Column 2, Lines 9-13). Kabe (US 5,042,545) describes the use of belt reinforcement structure formed of circumferential reinforcing elements, a plurality of crossed belt layers, and a cushion rubber in the shoulder region between the carcass and the belt structure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Justin Fischer

May 3, 2002

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700